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## Rail-Road News.

**Alabama and Tennessee River Railroad.**

The Selma (Ala.) Reporter annouces that contracts have been made on favorable terms for the graduation, masonry and bridging of this railroad to Montevallo.

But one year has elapsed since the books were first opened for subscription—then all was doubt and hesitation—now with the stock and the appropriations of the Legislature, the means of the Company exceed $1,200,000. All the surveys, making an aggregate of 1,000 miles, and all the estimates, &c., necessary to determine the location of the road, have been made, and about 56 miles of the road are under contract. We are assured, says the Reporter, that the next 4th of July we will have the pleasure of celebrating the advent of the Iron Horse in Mulberry Valley.

Arrangements are making to place under contract from fifty to sixty miles of the road in Talladega, Benton, and Cherokee counties early this winter.

**New Locomotives.**

Messrs. Norris & Brother, of Philadelphia, have just completed for the Copiapo railroad, in Chili, three of their large class engines, which will be shipped to this city and thence to their destination as soon as possible. Each of the engines has four five feet drivers, and the cylinders are 13 inches in diameter, with 26 inch stroke. They are to run on the new road recently constructed under the superintendence of Mr. Allen Campbell, of Albany, from Coldaro to Copiapo, a distance of fifty-five miles, to the copper mines of that country. The same enterprising gentlemen have now almost finished at their works, corner of Schuylkill Sixth and Fairview streets, two large engines for the New York and Erie Railroad. These mammoth "iron horses" are each built upon four wheels, 7 feet in diameter, with cylinders 14 inches in diameter, and 32 inch stroke.

**Pacific Railroad.**

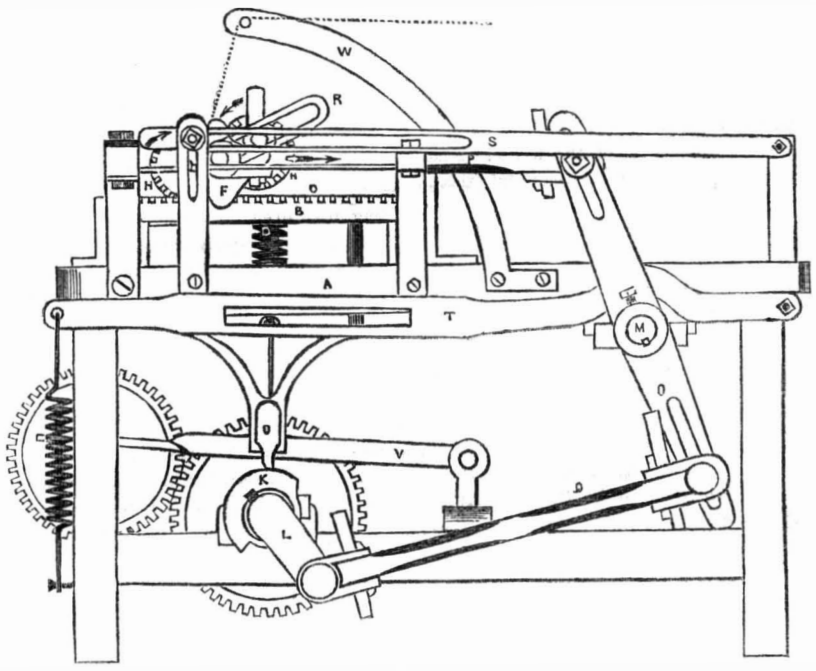
The Little Rock, Ark., Gazette announces the arrival at that place, from St. Louis, of Captain Joshua Barney's Surveying party, who have been engaged for a year past, under the orders of the Government, in making an experimental survey of a railroad route from St. Louis via Fulton, on Kid river, to El Paso, on the Rio Grande, and thence to the Pacific Ocean. The line marked by them deviates very slightly from a direct course.

**Indiana Railroads.**

Indiana is fast becoming to the West what Massachusetts has been to the East—the railroad State. The enterprise of her citizens in the construction of railroads is everywhere apparent. There are in the State nineteen railroads, either completed or in progress, the aggregate length of which is 1,205 miles. There are already completed 212 miles.

The citizens of Richmond Va., are about subscribing $100,000 to the Va. & Tenn. R. R.

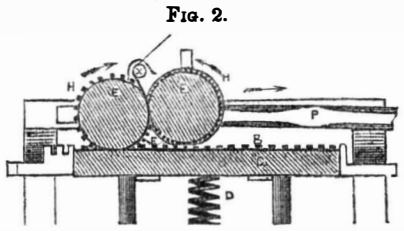
## MACHINERY FOR CALENDERING, FOLDING, AND MEASURING CLOTH.---Figure 1.




The improvements comprised in this machine are the invention of Mr. Henry Boot, of New Bedford, Mass. The principle of this invention is the folding and measuring of cloth, by passing the cloth between two rollers, which may be used as callendering rollers; and giving these rollers a reciprocating motion from end to end of a table, a yard long, to fold the cloth on, thus folding and rolling it at one time, and for which improvements the inventor has taken measures to secure a patent.

Figure 1 is a side elevation; figure 2 is a section of the rollers, the folding table, and the roller rack, and figure 3 is a plan view (looking down on the machine.) The same letters of reference indicate like parts. A strong table is made with legs, and a strong top, frame or sides, A A. B B are the racks, (one on each side, fastened on a bearer of the frame; C is the cloth-folding table; it is set between the two racks, B B, as represented in figure 3—it is exactly a yard long. This table is upheld by five iron bolts, two at each end and one in the middle; this middle one has a coil-

FIG. 2.




ed spring, D, around it; this spring abuts against the table above and a fixed block below, and supports the table altogether. The metal bolts work down through guide openings in the block below; this allows the table to be brought down below the rollers, so as to take off the folded cloth; this is done by pressing the foot on the outer end of the lever, and which is attached by a rod extending up a hooking, into the bolt of the coiled spring, D. By this operation the table is at once drawn down, but when released of the foot it springs up of itself, by the recoil of the spring. The two large cog wheels seen below, in fig. 1, are the driving wheels. L is a crank on the axis of the second wheel; it is connected by common links to the connecting rod, Q, and this rod is linked to a crank, O, which has a shaft, M, extending across the frame. To this shaft is secured a crank, extending up, which appears like a continuation of O, resembling a beam, but it is separate, and on the other side there is a similar one exactly, which is indicated by N, fig. 3—in which figure both cranks are shown in their relative positions, and as connected to the reciprocating arms, P P; these arms play an important part: they support the frame, F, which sustains the folding rollers, E E. Two strong bolts, secured in the ends of the arms, P P, support two plates, in which the rollers, E E, have their bearings. As the arms, P P, therefore, are moved backwards and forwards, by the upper cranks on the shaft, M, it will be plainly seen that the folding rollers, E E, will have a reciprocating motion. On the ends of the rollers, E E, are cog-wheels, H H; these wheels are to run on the rack-road, B B, which is secured at the outside of the table, C; the object of this is, that when the rollers draw in the cloth, and move to one end, one roller will be tilted up from the rack, and the other let down on it, to move in the other direction, so as to draw the cloth always down, inwardly, between the rollers. This is represented in figure 2. One roller, E, therefore, is moving on the rack, B

(Continued on Fourth Page.)

**American Artists in Rome.**

A correspondent of the London Anthenæum says the Americans seem to be the only people in Rome who are suffered to exhibit their political, artistic and religious heresies with impunity. Powers' emblamatic statue of the Republic of the United States is progressing, and Mr. Crawford's design for a monument to Washington is described by him as follows:—The design, for which $100,000 is to be paid, is original and striking. From the centre of a huge block of granite, cut into the form of a star with six rays, rises a pedestal, on which stands an equestrian statue of the Legislator, sixteen feet in height. The six points of the star are surmounted by six colossal statues—one of them an allegorical figure of Virginia, the hero's birth place—three of them statues of distinguished generals who were his companions in arms—the other two representing statesmen who were connected with him in the great struggle and succeeded him in the office of President. The casting, it is said, will be done in either Paris or Munich. All the figures except that of Virginia, are to be done in bronze. The writer says the Americans have just obtained permission to build a Protestant church—the first ever permitted in the Eternal city. Their architects are now at work—and in a short time the edifice will rear its head in the neighborhood of the ancient tomb of Augustus, and in the very Via de Pontifici.

**To Prepare a Solution of Gold.**

MM. Beckensteinir and Josselin's process:—Take 30 parts fine gold, 60 parts nitric acid of commerce, 120 parts hydrochloric acid of commerce. Place the gold in a porcelain capsule, of capacity quadruple that of the gold and the acids, and pour on it the acids, heating the mixture slightly until complete solution is effected. The excess of acid is then evaporated by a gentle heat, the chloride of gold thus obtained is dissolved in 400 parts of distilled water, and the solution passed through filtering paper; it is then mixed with an equal weight of the following solution of gum-arabic, composed of 504 parts of gum-arabic, and 1,000 parts of distilled water. The mixture is placed in a large evaporating vessel, the weight of which has previously been taken account of, and exposed to spontaneous evaporation, until reduced to 800 parts, stirring from time to time; it is then ready for use, and is put into well stoppered bottles.

**Reduction of the Gold in its Metallic form from the above Compound.**

This is accomplished by submitting paper, or any other substance to which the preparation of gold has been applied, to the vapor of phosphuretted hydrogen. This reduction is effected in from six to ten hours' time. If 1 part of phosphorus be placed in a porcelain capsule with 15 parts of an aqueous solution of caustic potash, two or three hours is sufficient to reduce the gold. If the temperature of this mixture be raised by bringing a lighted match in contact with it, so as to produce a disengagement of inflammable phosphuretted hydrogen, one minute will suffice to effect the reduction of the metal. The phosphuretted hydrogen gas should be collected in a wooden or paper recipient, of at least twenty times the capacity in volume of the object to which the solution of gold has to be applied.

**To Prevent Fermentation in Cider, Wine, or Beer.**

Add a small quantity of sulphite of lime; or bruise mustard seed, fourteen ounces to one ounce of cloves, and add to the liquid when first put into the cask, or a small portion of each may be added. The article is sulph-*ite* and not sulph-*ate* of lime. It is quite innocuous in any quantity.

**To Prevent Incrustation in Boilers.**

M. Guinon recommends the use of sugar and treacle for this purpose; he has found the addition of 12 lbs. of brown sugar, to keep a boiler 27 feet long by 3 feet in diameter clean for six months. M. Guinon does not give an analysis of the water supplied to his boilers, but states that previously to the use of sugar, he was obliged to clean out the boilers every three weeks, although he was in the habit of putting in a large quantity of potatoes after each cleaning.

**To Toughen New Earthen Ware.**

It is a bad plan to put new earthen ware into boiling hot water; it should first be plunged into cold water, and placed over a fire where it will heat moderately to the boiling point, and then be permitted to cool again. This process greatly promotes the toughness and durability of common earthen-ware, which is generally objectionable for domestic uses on account of its fragility.

At Suffiel, Mass., there are 30 cigar factories, at which 150 men are employed, who make up 300,000 cigars per week. The "regalias" made there are sold in New York for the genuine imported.

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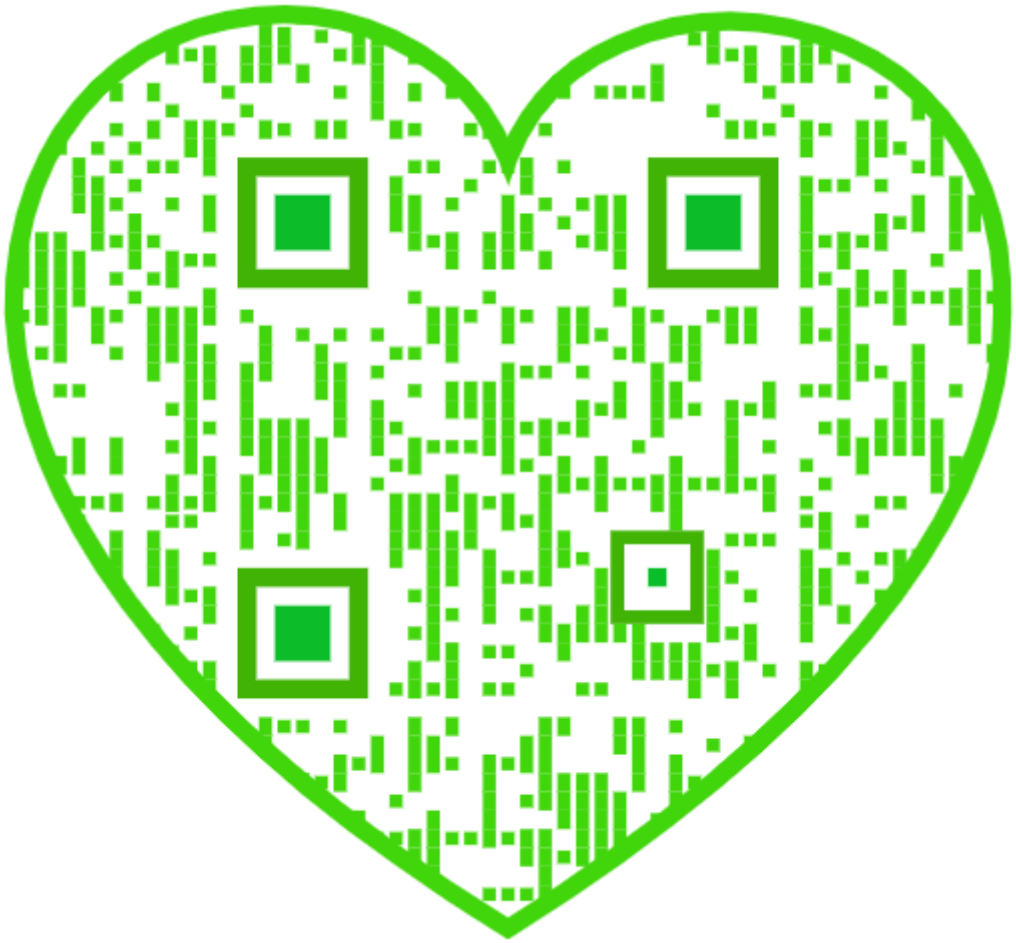

# Miscellaneous.

### Carrier Pigeons.

Mr. John Galloway publishes a letter in the Manchester Guardian (Eng.), wherein it is commenting on the reported arrival of the two carrier pigeons from Sir John Ross, in which we find something very interesting relative to those birds. He says "an express flyer of pigeons would just as soon think of tying a letter to a bird's tail, as under its wing. The practice is to roll some fine tissue paper neatly round the leg, secured with thread or silk; and thus the bird can travel, without the paper causing resistance or impediment to its flight. Then, more marvellous still, the creature must have flown 2,000 miles! a considerable distance of which must have been over snowy or frozen regions. In modern times, no such distance as 2,000 miles have been accomplished by any trained carrier pigeon. The merchants and manufacturers of Belgium have done more to test the capabilities of pigeons than any other people. Their annual pigeon races produce an excitement almost equal to our horse races. In 1844 one of the greatest races took place, from St. Sebastian, in Spain, to Verveir. The distance would be about 600 miles. The printed programme in French I hand for your perusal. Two hundred trained pigeons, of the best breed in the world, were sent to St. Sebastian, and only 70 returned. In another race to Bordeaux, 86 pigeons were sent and 20 returned. A strange and mistaken notion prevails that it is only necessary to send a carrier pigeon away from home and that its instinct will invariably lead it back. Let any one try the experiment, and send the best-bred carriers at once to Birmingham, and I venture to assert that not one will return to Manchester without previous training—viz., taking them short distances at a time and then increasing by degrees. It has been asserted that pigeons are guided on their return home from long distances by instinct. Instinct is said to be unerring; not so the pigeon's flight. If instinct be the guide, why not fly through foggy weather with equal speed and felicity as in clear sunshine? This it is notorious they cannot accomplish. When the ground is covered with snow, pigeons seem to miss their points of guidance, and are lost. This would seem to favor the opinion that they travel by sight, and are less indebted to instinct than is generally imagined. Carrier pigeons do not fly at night; they settle down if they cannot reach their home by the dusk of evening, and renew their flight at daylight next morning. The velocity of a pigeon's flight seems to be greatly over-rated; and, no doubt, your readers will be surprised to learn that a locomotive railway engine can beat a carrier pigeon in a distance of 200 miles."

Pigeons have been extensively used in America, for carrying the news about the drawings of lotteries, and the news by mail from Halifax. The telegraph has destroyed the business of pigeon training—the flying express has given way to the lightning one.

### Railroad Telegraph.

We have been informed by Mr. Post, engineer of the N. Y. and Erie Railroad, that a line of wire for an exclusive telegraph of the railroad, has been laid down. This is a measure which he recommended two years ago. This is a right worthy measure, and one which we have advocated, about the same time, nearly. Every railroad in our land shonld have an exclusive telegraph, more especially those who have no more than a single extended track each. We rejoice to know that with our go-ahead people the telegraph has been signally successful, but we are no more than in the infancy of telegraphing. We learn that one of our Telegraph Companies, whose wires extend between New York, Philadelphia, Baltimore, and Washington, with stations at all the intermediate places of any consequence, have increased their facilities for the prompt transaction of business, and have also made arrangements by which persons travelling through the places of any of the Telegraph Way Stations, can telegraph to any other place along the line, without having to leave the cars. A boy will pass through the cars at each station, and receive the dispatches, so that it will only be necessary for travellers to have their dispatches written before the cars stop, to secure their being safely sent to the desired place.

### "A Snail Telegraph." Wonderful Discovery.

The Paris corrospondent of the Literary Gazette writes:—"I have an astounding announcement to make to you, the marvels of the electric telegraph are annihilated, and the means of instantaneous communication between man and man, at any distance whatsoever, to the extremities of the earth, has been discovered! Yes, the last and most majestic of human discoveries has fallen from its height almost at the very moment at which it dawned on the world, and it is replaced by one a thousandfold more glorious, and which, if it only partially realise the commencement, will totally change the face of the world! And the means by which this wonderful thing is done are even more wonderful than the thing itself; snails, aye, snails, galvanic and magnetic influence! Do not think that I am hoaxing you, it is on the authority of the 'Presse' that I speak, one of the most important newspaper organs of Europe, in talent, character and circulation; and it is not to be believed that such a journal would be a party to an impudent and stupid attempt to bamboozle the public. In its numbers of Friday the 25th, and Saturday the 26th ultimo, there are two *feuilletons* signed by M. Jules Allix, No. 92 Rue Richelieu, roundly, formally positively asserting that the secret of effecting instantaneous communication, without regard to distance, and, consequently without continuous lines, as in the electric telegraph, has been brought to light; nay, more, that on the 3rd of this present month a question asked at the said 92 Rue Richelieu, received an almost immediate reply from the depths of America! and that this was done chiefly by the instrumentality of snails! The inventors or discoverers of the alleged marvel, are a M. Benoit, of the department of the Herault, and a M. Biat, of America. After many years observation and experimentalism, they, it is asserted, have ascertained that certain descriptions of snails possess peculiar properties or sympathies, which cause them to feel, no matter at what distance they may be, the sensation, or commotion, when acted on in a particular way by galvanic and magnetic influences.

Placed in boxes in such a way that, on being touched, they agitate particular letters, the operator has only to make snail A give a kick (*sic*) and snail A in a corrosponding box, which box may be in the backwoods of America or the deserts of Africa, repeats the kick, and so on for every letter of a required word. The snails must of course previously be put in sympathetic communication, and the boxes, with all their apparatus, which is rather complicated, must be alike. The shock which the snail in box 2 feels is said to be caused by an electric or magnetic fluid, carried by the earth with extraordinary rapidity, and in a manner unknown to man; in other words, it is the electric telegraph without the connecting wire. All this seems absurd, does it not? but I am describing the thing as it is said to be."

[This telegraph, we apprehend, is well named the "Snail Telegraph." France is a great country for new discoveries. We would not have noticed the above, only we have seen it copied into a number of papers. It is a piece of French nonsense.

### Explosion of a Steam Boiler.

At 7 o'clock, last Saturday morning, the boiler of the steam propeller Resolute burst, while lying at pier No. 13, East River, this city. The engineer, William Shepard, was killed on the spot, and four others were so badly scalded that they have since died. The boiler was considered safe, according to an inspector's certificate, obtained a few days ago, but the cause was over-pressure, there can be no doubt of that.

Harvard College has, this year, 311 professional students and resident graduates, and 293 under-graduates—total 604.

### Form of the Blast Furnace.

Sir—I am aware that the old form of the old blast furnace, with flat boshes, was considered to give a necessary support to the materials, and the assertion has been received as a truth, without any particular inquiry into the fact. But I think this opinion may easily be seen to be an error in every case, and that they never afford any greater degree of support, though a great deal of obstruction. If a perpendicular is erected from the edge of the hearth in the section of a furnace of this construction, until it meets the side wall of the lining, a triangular space will appear, forming in the filled furnace a prism of materials, the base resting on the boshes, so that as the mass tapers upwards, the smallest possible quantity of matter is supported. If another line is drawn upwards from the same point at an angle representing the course of the rushing blast in its expansion, a second prism will be displayed, lying behind, out of the direct action of the blast, in which dust, and all the semi-liquified requisites for scaffolding, used to effect a comfortable lodgement. This line, in a properly constructed furnace, will coincide with the lining, and if the first line be erected in the section of such a furnace, sufficiently widened above the boshes, a space will appear, which, taken in connection with the wider diameter, exhibits fully three times the cubical contents, as being supported by the boshes, and bearing directly upon the centre of motion. The truth is, it was discovered to be necessary to have the furnace of considerable wider diameter than the hearth, in order to prepare the materials; that enlargement was obtained in the way most convenient to the builder, without the least reference to principle, and its defects perpetuated by imitation. In Mr. J. Gibson's pamphlet "On the Construction of the Blast Furnace," he details the observations which led him to question the propriety of his form of structure; and having matured his views, he staked them on the construction of an entirely novel furnace, taking the action of the blast as his guide. The bold experiment proved most successful, effecting a saving of 30 to 50 per cent. in the fuel alone. His plans soon became general in Staffordshire, and are spreading throughout the kingdom, but in very numerous cases by the mere force of imitation, with as little knowledge of the origin and principles of the improvement, as had previously existed regarding the meaning and demerits of the old construction. DAVID MUSHET.

[The above is a letter of Mr. Mushet to the London Mining Journal, and will be of considerable interest to many of our readers. Mr. Mushet is well known to be one of the most experienced mineralogists in the world.

### The Complexion.

There are are six or seven various complexions of the human race, but they imperceptibly approach, and are lost in each other. The white and brown complexions include the Europeans, Western Asiatics, Chinese, Tartars, Northern Hindoos, and Africans, the Anglo-Americans, Spaniards, and descendants of Europeans in all parts of the Torrid or Middle Zone. Many of the higher classes in the tropical regions, who are not much exposed to the sun, are of a brown olive complexion, particularly the females. The greater part of the Mulattos, or yellow colored people, are in China and Eastern Asia. The copper or bronze-colored Indians, are nearly all in America.—The Burmans, Malays, and Australians are mostly dark brown or tawny; the central and southern Africans and Hindoos, jet black.

### Glass Palace for the Industrial Exhibition.

It will not do for our people to call Uncle John Bull a slow fellow, or to call the English a people fond of sticking to old things,—they are the reverse. The London Glass Palace, for the Grand Exhibition, will be one of the seven wonders—the greatest wonder of the Fair. To add to its decorations, a proposition, and a good one, has come from America. The London Times says:

"We have seen a letter addressed to the Commissioners, from which the following curious particulars are gathered:—Benjamin Hardinge, of Cincinnati, has proposed to cover the iron columns, pilasters, entablatures, &c., with a kind of porcelain or variegated enamel, giving them all the richness and beauty of the choicest polished marble and precious stones, viz., the agate, chalcedony, jasper, and other silicious formations. He also proposes to apply liquid silicates to the glass, in variegated colored crystals, in prismatic or softly blended rainbow tints, which are said to be translucent and beautiful; giving a mellow light, which supersedes the heretofore contemplated blinds. The expense is comparatively small, the material being composed of quartz or white sand, dissolved in large quantities through the agency of hydro-fluoric acid and other solvents, the colors of oxydes of minerals, &c. It is said to be the cheapest finish upon iron, or other substances, ever before known; and is applied withgreat facility, and so hard as not to be moved by a file."

Mr. Hardinge is now at the Howard Hotel, superintending his chemical works in the north part of this city.

### World's Fair in London.

The slow Committee appointed by Gov. Fish, for the State of New York, to examine articles intended for the World's Fair, are to meet at the American Institute on the 3rd Dec., at which time all persons residing in the State of New York, intending to exhibit at the World's Fair, must make known their intentions to the Committee, and receive its sanction, otherwise their articles will not be received at the Fair in London.

The Government vessel which is to convey articles from the United States to the Fair, will sail from the city of New York on or about the 10th day of January next. Vessels engaged in the Revenue service of the United States will be detailed by the Secretary of the Treasury for the purpose of conveying to N. Y., all articles from the various seaports along the coast, to be shipped in said vessel.

We understand that arrangements have been made at the Navy Yard, Brooklyn, to receive and store all goods, until ready to be shipped.

### Wreck of the Lexington.

We find in the Boston Daily Mail an interesting account of the operations of Mr. J. E. Gowan, of that city, upon the wreck of the ill-fated steamer Lexington, which was burnt and sunk off Huntington Light, in Long Island Sound, Jan. 13, 1840. By means of their celebrated sub-marine armor and diving apparatus, a complete survey was made of the wreck, which was found in twenty-one fathoms of water, or one hundred and twenty-six feet below the surface. The hull was found full of mud, and completety "honey-combed" by worms, lying by a reef of sand which had been thrown up by the current, running N. E. and S. W. Their object was the recovery of a safe containing the sum of $80,000 in bills and gold. They have succeeded in raising one of her anchors and the anchor and cable of another company who had made an unsuccessful attempt upon the wreck. They also recovered portions of the machinery, some gold and copper, and human bones of the ill-fated passengers. They are sanguine of recovering the safe as soon as the weather will permit

### Stame---Steam.

Mr. James Frost, of Brooklyn, delivered a lecture at the American Institute, on Thursday evening, last week, on his new discovery of Stame, (steam heated apart from water,) which was described in our last volume. The audience was small but respectable. The lecturer illustrated his subject by experiments. The principle of this discovery is, that steam, heated apart from water, doubles its volume with about every four degrees of heat. Mr. Frost has an engine with a boiler, the steam of which is carried through hollow grate bars, to test the experiment. As Mr. Frost's pamphlet was published, nearly in full, in our last volume, we refrain from saying anything more about it.

A person in this city has engaged to build a yacht of 150 to 180 tons, to be ready to sail during the World's fair in London, and to beat any vessel brought against her, or the builder is to receive no compensation for his labor, otherwise he receives $30,000.

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For the Scientific American.

## The Voltaic Battery.---Precipitation of Metals.

NUMBER VI.—(CONCLUDED.)

We will now take into consideration those difficulties which beset the first attempts to substitute the voltaic precipitation of silver in the place of the ordinary practice of plating, by first rolling the metal into a thin sheet, and soldering it on the basis.

The first experimenters observed that the silver peeled off, when the burnisher was applied, and also that it would rise in blisters by a gentle heat, and very frequently the adhesion would be so slight as to let the silver peel off by gentle polishing.

The non-adhesion exhibited by the burnisher is owing to the extreme ductility of the voltaic silver, although the film may be in perfect union with the base, yet from the suddenness of the termination of one metal, and beginning of the other, and their different degrees of malleability and ductility, the action of the burnisher is confined entirely to the film: although the expansion may appear as trifling, yet, being a molecular force, it must be irresistible. Everybody is familiar with the action of these forces in the bursting of rocks by the freezing of water, and also in the breaking of iron and porcelain by unequal expansion.

To obviate this, the surface to be plated should be well rubbed with fine sand-paper, or roughened by nitric acid when the article will admit of such treatment. After this roughening, the article is given a thin coating of quicksilver, by dippping it into a very dilute solution of nitrate of mercury for a few moments, then wiped off, rinsed in hot water, and put into the silver bath. The film of mercury acts as a solder in joining the two metals; the suddenness of the transition from one metal to the other is avoided by the mercury dissolving a minute portion of the two metals, and commingling them together.

Another great cause of non-adhesion arises from the deposited metal not being in actual contact with the base, from the intervention of heterogeneous matter. When a base metal is put into the cyanide of silver, it decomposes it; the cyanogen forming an insoluble coating of cyanide of zinc or copper, and on this coating the silver, which had been in union with the cyanogen, is deposited, giving the article a silvered appearance. We may now perceive that no matter how well an article has been cleaned prior to the battery operation, there is, after all, a coating of dirt under the silver: for the very immersion into the bath converts the surface into a cyanide. This spontaneous decomposition is well exhibited by dipping a piece of polished steel into a solution of sulphate of copper: in a few seconds the steel is coated with a bright film of copper, but there is not the least adhesion, and examination shows that under this beautiful deposit of copper there is a dirty layer of sulphate of iron.

In connection with what is said about this spontaneous decomposition, let it be understood that when the metal is precipitated by the battery, the acid or other solvent is outside; and also, that rapidly as the solution acts on the base, yet it still requires time, and that the cyanide of potassium acts more readily than the cyanide of silver. Taking all these circumstances in view, we are pointed to the following remedy: the solution should be very strong, and contain no more cyanide of potassium than sufficient to dissolve the cyanide of silver. The battery should be very strong on the article at the moment it is immersed in the bath. The article, once coated by the battery action, should be well brushed with chalk, after which the silver may be thickened by arrangements of the battery for preventing the black deposit noticed in the number on "Gilding." The silver deposited by this method, in conjunction with roughening and amalgamating, resists every attempt to separate it from the base.

Another trouble which attends a thick coating of silver is, that it is apt to become very rough, and also that some parts will blacken while other parts will work clear. A pure solution and thorough agitation are the remedies here.

Along with the silver a small portion of cyanide is deposited: this makes the silver tarnish very quickly. To get rid of this cyanide, the plated articles are laid in a warm and dilute solution of sulphuric acid for half a day, then very slowly heated in an oven to the temperature of boiling oil, and kept at this heat for a day; after this the articles are to be finished by burnishing, and other modes of finishing silver articles. VOLTA.

## Inauguration of the Great Colossal Statue of Bavaria at Munich.

Almost every body has heard of the great annual People's Festival which was held at Munich last October, and which was of special interest this year, and attracted an unusual number of strangers, from the fact that the uncovering of Schwanthaler's colossal statue of Bavaria was to take place during this great week of gaiety.

This stupendous work of art—awful in its Titanic proportions and its calm majestic beauty—the result of ten years' incessant anxiety—stands on a broad meadow to the west of Munich, a portion of the great plain that stretches away to the feet of the Alps. It rests on the edge of what appears at first to be an artistical terrace—but is in fact, a huge step where the plain suddenly descends into the lower plain on which stands the city of Munich. The figure of this colossal Virgin of the whole German world, with her Majestic lion by her side, is 54 feet high, and is placed on a granite pedestal 30 feet in height; so that the beautiful temple of the "Ruhmeshalle," or Hall of Fame, erecting behind, seems dwarfed into strange human insignificance.

This figure, typifying the spirit of recognition and reward of all excellence and achievement whatever, stands with upraised wreath, as if ready to crown any Bavarian who may be worthy to enter her temple fame. It was a grand idea of King Ludwig's, this of placing the Genius of Reward on the spot consecrated to the people and their annual meeting.

The "Ruhmeshalle" is unfinished, and will require for its completion at least two or three years more. It is a beautiful Doric building, of white marble from the Untersberg, adorned with emblematical friezes by Schwanthaler. It was designed by Leo von Klenze; and the busts of all the great men of Bavaria, without regard to difference of religious belief, or to origin, are to be arranged along the walls.

Through the interior of this bronze tower-like figure ascends a winding staircase, leading to a chamber in the head, large enough to contain 28 persons—whence, through openings among the curls, the spectator can look across the plain and city towards the glorious Alps. This may give an idea of its colossal size. But beyond the poetry of mere size—a grand idea arises from reflecting on the ten years of toil—stupendous toil—mental and bodily, of its creators—the difficulty overcome by patient industry—the dangers endured with unflinching courage—and the melancholy truth that the final accomplishment of the mighty work is unwitnessed by the two men whose lives seemed bound up in its success—Schwanthaler, the sculptor, and his friend Lazarini, his "right hand," as he called him, who modelled the colossal figure under his direction.

Though Schwanthaler was already attacked by his fatal malady at the time when he designed the "Bavaria," at the King's suggestion—he not only modelled a variety of designs for the Colossus, but also completed a smaller figure of the "Bavaria," as they now see her, 13 feet high. When the huge wooden tower was built in the Royal Bronze Foundry, and after what may be called a gigantic wooden skeleton had been erected by a crowd of carpenters—after tons and tons of clay had been piled together over this, so as to form a mass of material on which to work—there, day after day, might be seen the unwearied, energetic, though physically-suffering sculptor, guiding with watchfulness and love the accomplishment of his idea, which ever grew beneath the hand of his friend Lazarini and his troup of workmen.

Stiglmayer, the originator and director of the Bronze Foundry, died in 1844, just before the casting of the "Bavaria" began. His nephew, Ferdinand Miller, full of youth, energy, patience, and experience, was ready to succeed him. The casting took place at five different times—commencing with the head. This was cast in 1844. In casting the bust of the figure—the largest portion—the greatest difficulty had to be encountered. It was necessary to melt, for the purpose, twenty tons of bronze—five tons more than had ever before been melted in the furnace. As this immense mass of metal slowly began to fuse, it began also to cake—thus threatening to destroy not only the casting, but the whole furnace, with untold danger to life and limb. Six men had, in spite of the oppressive heat and the ever-increasing glow of the furnace, to take it by turns, night and day, incessantly, to stir with long iron bars the molten mass lest it should adhere to the furnace walls, and so bring annihilation on all. On the evening of the fifth day of anxiety, when Ferdinand Miller, for the first time, sought a short repose in his chair, he was suddenly aroused by his faithful and anxious fellow watcher, his wife, with a cry of "Ferdinand, awake, the foundry is on fire!" It was so. The ever-increasing heat of those five days and four nights had caused fire to burst forth among the rafters. To have attempted to extinguish the fire by water, with this molten mass below, would have caused the immediate destruction of the place. All that could be done was, by means of wetted cloths, to keep down the fire. This was tried—and the melting went on as before. Amid such danger did the casting of the bust take place. About midnight on the 11th of October, 1845, "Success" was shouted forth; a load of anxiety of many kinds fell from every breast; and all then hastened to the complete extinguishing of the fire.

## Jacquard and his Machine.

No one man, we believe, has done so much towards improving and advancing the manufacture of ornamental textile fabrics, as M. Jacquard. France, Italy, Germany, Britain and America, pay tribute to his fertile genius. In silk weaving, his loom has supplanted all others; it is also extensively applied to the manufacture of carpets, and the making of ornamental lace, of both silk and cotton.

Jacquard was not brought up a weaver or machinist, he was originally a straw hat manufacturer, and it was not until after the peace of Amiens that his attention was attracted to the subject of mechanism. The communication between France and England being then open, an English newspaper fell into his hands. In this he met with a paragraph stating that a premium would be awarded by a society in that country to any person who should weave a net by machinery. The perusal of this extract awakened his latent mechanical powers, and induced him to turn his thoughts to the discovery of the required contrivance. He succeeded, and produced a net woven by machinery of his own invention. It seems, however, that the pleasure of success was the only reward he coveted, for as soon as accomplished he became indifferent to the work of his ingenuity—threw it aside for some time, and subsequently gave it to a friend as a matter in which he no longer took any interest. The net was by some means at length exhibited to some persons in authority, and by them sent to Paris. After a period had elapsed in which M. Jaquard declares that he had entirely forgotten his production, he was sent for by the Prefect of Lyons, who asked him if he had not directed his attention to the making of nets by machinery. He did not immediately recollect the circumstance to which the Prefect had alluded; the net was however produced, and this recalled the fact to his mind. The Prefect then rather peremptorily desired him to produce the machine by which the result had been effected. M. Jacquard asked three weeks for its completion; at the end of which time he brought his invention to the Prefect, and directing him to strike some part of the machine with his foot, a knot was added to the net. The ingenious contrivance was sent to Paris, and an order was thence dispatched for the arrest of the inventor. Accordingly, M. Jacquard found himself under the keeping of a gens-d'arme, by whom he was to be conducted to Paris in all haste, so that he was not permitted even to go home to provide himself with the requisites for his sudden journey. When arrived in Paris he was required to produce his machine at the Conservatory of Arts, and submit it to the examination of inspectors. After this ordeal he was introduced to Bonaparte and to Carnot, the latter of whom said to him, with a look of incredulity, "Are you the man who pretends to this impossibility—who professes to tie a knot on a stretched string?" In answer to this inquiry the machine was produced, and its operation exhibited and explained. Thus strangely was M. Jacquard's first mechanical experiment brought into notice and patronized. He was afterwards required to examine a loom on which from twenty to thirty thousand francs had been expended, and which was employed in the production of articles for the use of Bonaparte. M. Jacquard offered to effect the same object by a simple machine instead of the complicated one by which the work was sought to be performed,—and produced the mechanism which bears his name. A pension of a thousand crowns was granted to him by the government as a reward for his discoveries, and he returned to Lyons, his native town. So violent, however, was the opposition made to the introduction of his loom, and so great was the enmity he excited in consequence of his invention, that three times he, with the greatest difficulty, escaped with his life. The *Conseil des Prud'hommes*, who are appointed to watch over the interests of the trade, broke up his machine in the public "place;" "the iron (to use M. Jacquard's own expression) was sold for iron—the wood for wood, and he, its inventor, was delivered over to universal ignomy." The ignorance and prejudice which caused the silk-weavers of Lyons to destroy a means of assistance to their labors, capable of being made a source of great benefit to themselves, was not dispelled till the French began to feel the effects of foreign competition in their silk manufacture. They then were forced to adopt the Jacquard loom, which led to such great improvement in their silk weaving; and this machine is now extensively employed through the whole of the silk manufacturing districts of France, as well as of England and America. By reference to page 286, Vol. 3, Sci. Am, comparing the artical there with this one, a very good history of this extraordinary man will be made out.

## French Farming.

Although the French modestly boast of being at the head of every nation in everything, they are, with few exceptions, the most backward of all in things the most essential. In agriculture, for instance, which is their principal resource, they are most shamefully behind the English; they use the clumsiest instruments, are totally ignorant of others of great utility, and adopt, with strange pertinacity, the vicious system of cultivation which was employed centuries ago. The consequence is, that, though they have a soil far more fertile, and a climate immeasurably superior, they cannot equal the English production in wheat, barley, oats, or potatoes, their yield being on an average full one-third less per acre than theirs. And as to the breeding of cattle, they are "no where," their oxen being wretched things, and awfully dear; the consequence of which is, that meat, instead of being considered indispensable to every man, is not consumed at all by millions, and is a rare luxury to the majority of the rest of the population. But what shows the discreditable state of agriculture more strongly, is the fact that it is only very recently that the French have become aware of the importance of draining; and that what little draining has been effected has been done almost exclusively by the Government.

A number of scientific gentlemen of Belgium have lately made some meteorological observations on the heights of Belleville, Paris. They sent up to a certain height several kites, to which were affixed a number of needles, and although the weather was perfectly serene at the time, they drew from the clouds flashes of electricity similar to those which accompany a storm.

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# New Inventions.

### Improved Grain Separator.

Mr. Jonathan Booth, of Cuyahoga Falls, Summit Co., Ohio, has taken measures to secure a patent for some improvements in Grain Separators, which have been pronounced, by those who have seen the machine operate, both new and useful. There is a peculiar curved conduit, which has direct communication with the blower—the conduit curving upwards, and the blower placed near the floor. This conduit has two outlets, or miner spouts, projecting out near the top; one is for grain of a certain lightness, which is carried above the full heavy grain, and the other, at the top, is for the lightest and most impure grain. The thrashed grain, with its chaff, &c., is fed in by a hopper, on to a vibrating screen, and by drawing a small slide, communication is had with the blast in the conduit spoken of, when the chaff is all blown out behind, through the screen, and the heavy grain passes into the conduit and down into the grain box, while that which is lighter, is carried up by the blast in the conduit, and passes out through the first minor spout spoken of; that which is still lighter, is carried further up, and passes out of the top spout. There may be more spouts, but two separate the grain into three distinct qualities, by the force of the blast passing up. By the slide which communicates with the screen, the blast can be directed in strength, either through the screen or through the conduit—and thus it can be easily regulated for separating different kinds of grain.

### Improvements in Planing Machinery.

Mr. L. W. Pease, of Oriskany Falls, Oneida Co., N. Y., has taken measures to secure a patent for improvements in wood planing machines, which have been held to be good and novel, by some who have seen it, and who are well acquainted with planing machines. He employs rotary cutters, but no pressure rollers; the board or plank being fed in by an eccentric series of moving graplers, (we can find no other name for them,) which are guided in their action by side revolving rollers, with cam grooves in them. The cutters are set upon the cylinder radiating from the centre, and there is a stationary finishing knife to complete the operation, after the board has been acted on by the rotary cutters.

### Clay Tempering Machine.

Mr. Heman Whipple, of Port Richmond, Staten Island, N. Y., has invented a machine for tempering clay for making bricks, which is a good improvement, and for which he has taken measures to secure a patent. There is a large outside slatted metal cylinder, set horizontally upon an incline; and in the inside are a number of revolving beaters. The unworked clay is fed in at the higher end, and the beaters act upon it and puddle it through the crevices of the outside cylinder, while the stones and hard unworked lumps, are worked down to the lower end, and discharged there. It works the clay well, and discharges it in a very acceptable state for brick making. Good tempered clay, and simple and strong machinery to work it, are very important objects.

### Reefing Topsails from the Deck.

The Naval Gazette, England, states that on the "Iberia," one of the Oriental and Peninsular Steam Company's steamships, an important improvement has been introduced by a Capt. Cunningham. The top sails act upon the self-reefing principle. From the time the yard is lowered, it is close-reefed in two seconds. The reefs may be again taken out and the topsail at the mast-head, in 20 seconds. We have heard of a lake invention being used on some of our American vessels, some years since, but we cannot tell now whether it has been successful or not. The above invention is highly spoken of.

### Balloon vs. Steamboat.

The greatest inventions of the age are balloons, but somehow or other they are not successful, as we have good evidence in believing that the California Balloon has been surpassed by the steamboat.

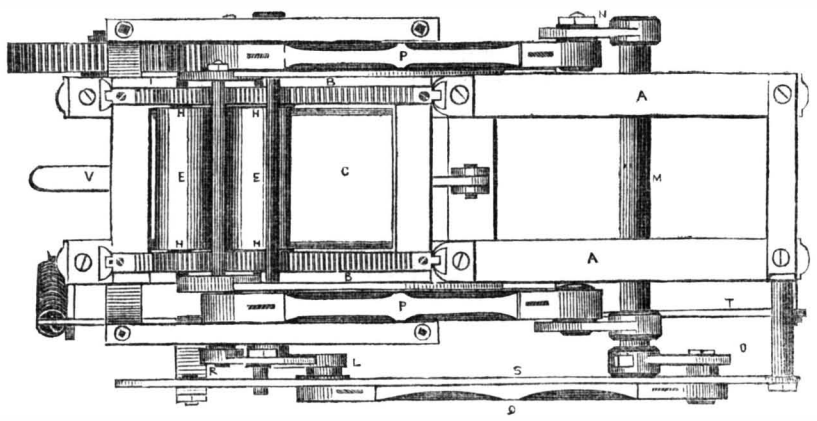
## MACHINERY FOR CALENDERING, FOLDING, AND MEASURING CLOTH.---Continued from First Page.

to the right hand, in figure 2, and when it has moved to the end of the rack (folded one yard) it will be tilted up, and the second roller, E, will mesh into the rack so as to draw or feed the cloth always between the rollers; this motion is necessary to the correct action of the rollers. The dotted lines represent the cloth coming over a roller on the ends of two fixed curved supports, W W.

Although this machine is very simple, there is some difficulty in describing it to others, and the tilting motion of the rollers is the difficult, and only difficult part, yet, by paying close attention, a good knowledge of this will be obtained.

On the shaft of R is a crank, which revolves with the shaft; pressing on its surface or periphery, is a metal foot, U; this foot has a leg, which is united to the longitudinal rod, T, and this is united by a bolt to one end of the frame, and at the other to a string coiled spring. To the rod, T, there is secured an upright arm, which passes up outside, standing out from the rollers, but in figure 1 appears to run up close to the roller plate, F. This arm is connected by a pin passing through a slot in the top longitudinal rod, S; into this slot there passes a pin from a slotted arm, R, which is secured on the outside of the shaft which supports the bearing plate of the feeding rollers,

Figure 3.




after passing through the ends of the reciprocating rods, P P. It will be observed, then, that if the rod, S, is moved up and down like a treddle, it will guide the pin of the the crank arm, R, in the slot, so as to turn the axis of the roller plate, F, and give the said plate a vibratory motion to change the feeding rollers on the rack, as has been described before. This tilting motion is then mainly given by the cam, K, one half of which is projecting for one fold of cloth, and the other, from the two projections, is a depression for the other fold of cloth. The foot, U, is lifted or pushed up by the projecting part, and this lifts up the arm above, and elevates one end of the rod, S, and when the cam, K, revolves till the foot, U, comes to the depression, the coiled spring at the left hand, at the end of the frame, brings down the end of the rod, S, and this, acting upon the pin of the slotted crank, R, gives the supporting shaft of the plate, F, of the feeding rollers, a tilting motion, to raise and lower the feeding rollers, to and from the rack, to give them the centre feeding motion, so as to take in and fold the piece on the table, as described.

An index may be placed with gearing, connected with the driving wheels, to tell the number of yards folded. The rollers may be either calender or mere feed rollers; the rollers, however, are an essential part of the invention. Of the many folding machines which we have seen, this one is different in its roller, folding and feeding motion. More information may be obtained by letter addressed to the inventor.

### Foreign Patents, Collated from our Foreign Exchanges.

"Newton's London Repertory of Arts," &c.; "The London Patent Journal and Inventors' Magazine;" "Mechanics' Magazine;" "Glasgow Practical Mechanic;" "Le Conservatoire," and "Annales des Chemins de Fer," of Paris.

Dressing Stone.—In the Repertory of Arts, for November, we see that Wilson's American Stone Cutting Machine was patented in England, on the 6th of this month. This machine was illustrated on page 284, Vol. 5, Sci. Am. Five machines are now cutting stone at the foot of 28th street, East River.

Improvements in Cards.—M. Eugene A. D. Boucher, of Paris, has patented an improvement in cards, for cotton and wool carding; it consists in coating the iron with a less oxidizable metal than the iron of the wire. The process is to coat the wire by simple immersion, in a solution of one ounce of sulphate of copper, and half an ounce of sulphuric acid in five gallons of water heated to 86°. When the solution is cold, the wire is drawn through it, when it becomes coated with copper. The wire is then drawn through a plate, to make the wire even, and the copper adhere. It is thus dipped and drawn two or three times, until a good coat of copper is put on. This is a subject for our wire drawers.

Steel from the Ore.—J. M. Heath, residing near London, has taken out a patent for making steel from the ore. He prefers to use the magnetic iron ore, such as is found in the northern part of New York State. The ore is first reduced to the metallic state, by depriving it of its oxygen, by roasting, and after this he takes the roasted metal, mixes it with a portion of manganese and some tar (either coal or wood,) in about the quantities of 3 pounds of manganese to one and a half gals. of tar, for each 100 lbs. of the deoxidized ore. This mixture is heated in a reverberatory or other good furnace, and when at the welding heat, it is removed from the furnace to the rollers, and formed into blooms. The blooms are re-heated and rolled into bars in the usual way, and after this they are converted into steel by the usual process. This process is altogether behind that of Mr. Dixon, in Jersey City. He makes good steel direct from pig iron.

Sugar Refining.—Mr. Thomas Dickason, of Ayrshire, Scotland, has taken out a patent for improvements in centrifugal machines for refining and depurating sugar. One improvement is to prevent oscilation in the revolving pan. This oscilation is a great evil in centrifugal machines, owing to the tendency of the machine to fly off at a tangent. Mr. Dickason employs friction rollers between the fixed bearings of the shaft and the socket of the revolving pan. He has a different way, also, of mixing the syrups for the action of the machine. He runs the syrup direct from the vacuum pan into large shallow coolers, each capable of containing about 500 gallons, at a temperature of 120°, and strength of 35° Beaume. This is cooled and put into the centrifugal machine.

Steam Boilers.—Messrs. John Turner & Joseph Hardwick, of Birmingham, secured a patent on the 15th Oct., for setting boilers. There is a central tube or flue within the boiler, in the usual manner, from end to end of it; the fore end of this contains the fire-bars and ash-pit, as usual, and a brick bridge is built up just behind it; immediately behind the fire-bridge, the flue is contracted in diameter, and immediately above this contraction, upon the top of the boiler, is placed the ordinary man-hole. The patentees state that their only object in this construction is to better enable a person to enter the boiler for the purpose of cleaning it, by giving more room to do so. The return side flues of the boiler are constructed as usual, with the exception of the front end of the boiler, where, instead of the flues traversing around the outside of the boiler, the heated air and products of combustion are conveyed across from one side of the flue of the boiler to the other, by metal flues passing transversely through the body of the boiler, close to its front end. The drawings show two of these flues, one above the central tube or fire place, and the other beneath it. These flues are shown to occupy as little vertical space in the boiler as practicable.

Improvements in Milling.—Mr. Charles Seely, of Heighington, in Lincoln Co., enrolled a patent of the 5th of last month. It consists of an annual chamber formed in the eye of the runner, which is left open for the introduction of the grain in the ordinary manner. This annular chamber is carried above the stone, and is in connection with the horns, which pass horizontally from the centre in a curved direction, so as to expose the mouths of the horns directly to the air, which enters by reason of the runner's motion. The air is thus carried into the annular chamber in the eye of the stone. This chamber terminates at the lower side of the runner, slightly curving under that stone, in order to direct the air between the grinding surfaces; to facilitate this, the corner of the stone in the eye is removed or rounded. The horns at the mouth are furnished with a blade or fan on the inner diameter, which is inclined towards the mouth, by which the air collected by this blade is carried into the horn. A casting is provided in which the mouths of the horns' route, which forms a circular channel, bounding them up on the upper and under sides, and also at the circumference, by which the air thrown off by the centrifugal force arising from the rotation of the horns is collected, and presented to the horn mouths, by which the passage of the air between the stones is facilitated.

### Gas for Factories.

In England nearly every manufactory of any consequence prepares the gas which it uses in lighting the factory—the machinery requisite not being very costly for preparing gas to a considerable extent. Every factory in our country should use gas. Let those who use oil try gas one season, and then they will see the difference both in comfort and price.

### Strange Phenomenon.

An English brig, the Ellen Anne, was lately struck by a meteoric stone, while in the British Channel. The report was like a musket charge, and the planking of the deck was torn up and perforated in several places as if by musket shots. No signs of a thunder storm were to be seen or heard, though the day was dull and lowering, with a fresh breeze. The occurrence is said to be very rare in the British channel, though frequent up the Mediterranean.

### Discovery of a Third Ring to Saturn.

We learn from the "Boston Traveller," that on Friday night, the existence of a third ring around this Planet, which had been for some time suspected, was ascertained by the astronomers at Cambridge. It is interior to the two others, and therefore its distance from the body of Saturn must be small.

### Gutta Pescha.

We know of no substance which has come into such general use, in such a short time, as this. It is now used for pipes, whips, shoe soles, picture-frames, &c., but perhaps its most useful application is the coating of the telegraph wires.

It is now proposed that the glass palace in Hyde Park shall be a permanent erection, and be converted into a winter garden for shrubs and plants indigenous to the temperate zones.

The Koh-i-noor diamond, or Mountain of Light, will, it is said, be placed among the collections of minerals at the Exhibition in Hyde Park, next year.

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### Commissioner of Patents' Report.

Having briefly reviewed the Reports of three Chief Examiners, the fourth is that of Chief Examiner L. D. Gale: it is the best and most elaborate and interesting. He does not seem to have grudged his labors, nor does he complain of hard work, like Examiners Fitzgerald and Renwick. His field of examination embraces five classes—1st, Agriculture; 2nd, Chemistry; 3rd, Leather; 4th, Household Furniture; 5th, Wearing apparel. He examined 599 cases; passed 245, and rejected 354—[the report is not correct, here]—a great number, but not quite so many in proportion, as the two Examiners named.

The most important and valuable inventions presented in 1849, he states, are to be found in the class of chemistry, especially three of them: one was for an improvement in sugar manufacture [Melsen's process,] the other, Dr. Hare's process for converting animal matters into agricultural fertilizers, and the next was for the use of resin oil in making printers' ink. It is stated that neither of these inventions were patented, but there was a probability that they would be, after a *prolonged correspondence* was terminated, and Mr. Gale thought it was right to notice them. Beehives, washing machines, plows, churns, and bedstead fastenings, the Report states, have arrived at that point where the limits for improvement are very narrow. We understand that the Patent Office has decided that atmospheric churns are not patentable—that air has nothing to do with the churning to produce butter. It is no doubt true that butter can be produced by agitation in an air-tight bottle—we have seen this done frequently, with sweet milk, to produce a fine salve for burns. Six patents were granted for small improvements on Cultivators, and twenty for Seed Planters. Twelve Harvesting Machines were patented—one was for a rake to move the grain to the back of the platform, to deposit it in bunches on the ground. One patent was granted for a machine to harvest cotton and abolish hand-picking. The Report speaks doubtfully of its application to picking, as all the bolls do not ripen at the same time on the plant. If such a machine were practicable, it would be, perhaps, the most important invention of the day. Nine patents were granted for Hulling Machines, and nine for Grain Separators. Five patents were granted for Bee-hives: we shall publish the whole of the remarks about bees and their hives, next week,—new ideas are thrown out, which must be interesting to our apiarians. Three patents were granted for Distilling Apparatus; one was for elevating the head of the still into a cylinder, and having perforated pan-shaped vessels therein, containing charcoal, which purifies the spirits at one operation. Especial mention is made of the process for coating iron with copper—the invention described by us two weeks ago, a sample of which we have in our office. A process for making Water-gas was patented, and Prof. Gale states that an English patent was granted to Michael Donovan, (Prof. Donovan, of Dublin, we suppose,) 40 years ago, for mingling spirits of turpentine, at the burner, with gases derived from water,—the remarks about water-gas are judicious and conclusive, presenting a great amount of new information. He states that when gases are too highly charged with carbon, iron heated to redness will take up the excess of carbon, and produce a fine illuminating gas,—he dees not think much of the water-gas processes. The process for making artificial manure, as a good substitute for guano, consists in submitting animal matters to the action of mineral acids—one part of sulphuric acid to five of animal substance. Copperas will also answer: as a deodorizer, the copperas has long been known.

A patent granted for an improvement in tanning, consists in unhairing the hides by a composition of lime, potash, and salt, and the use of acids to open the pores of the skin, then at once submitting the same to the tanning process. Particular mention is made of the Apple-paring Machine, illustrated on page 84, Vol. 5, Sci. Am.

It is not possible to dwell particularly on all the inventions spoken of in this Report—we have noticed a few. We like the Report, it is able, useful, and does honor to the Patent Office.

The Report of the Machinist, Mr. A. B. Stoughton, informs us that there are 15,117 models in the Patent Office, and only 7,529 for which patents were granted. He says that no adequate provision is at present made for the proper exhibition of models pertaining to rejected applications. He says that many are rejected as machines invented in foreign countries, and only described in books not accessible to inventors. If he could have added that "many were rejected because they were *supposed* to be like some described in foreign books," he would have struck the nail on the head at once. The number of models, he supposes, cost $500,000, and he justly complains that no adequate room nor provision is made for their exhibition, so as to benefit inventors. We subscribe to this sentiment, in part; we say that the Patent Laws should be so altered, that rejected applicants might have their models returned. Here we are informed that the Patent Office has locked up in its Black Room, more than $250,000 of the property of our inventors—property for which no adequate return has ever been made. There is one wretched mode of action in the Patent Office, viz., to reject applications and give reference to some rejected application; this is a nonsensical mode of doing business. There are eight rooms devoted to models, and they are still accumulating with great rapidity. It is suggested that, for designs on stove plates, a drawing, and no model, be sent to secure a patent: this is a good suggestion. The Report of Mr. Stoughton is short, but very good for all that; the suggestions made by him evince good judgment and good sense.

### Patent Laws of all Nations.

Many of the inventors, in Great Britain, threaten not to exhibit at the World's Fair, and to do all they can to prevent others from exhibiting, unless the Patent Laws are reformed by Parliament at the Winter Session. It is not possible for a poor inventor to secure a patent in England. The patent laws of that country were made for the rich, and afford ample means for robbing the poor. To secure a patent in England, every step is attended with expense—money, not paid into the national exchequer, but absorbed by the great officers of state and their underlings. The Attorney General has a fee of four guineas for making a report upon the inventor's declaration—a subject about which he is as innocent as the hippopotamus is of astronomy.

The Home-office pockets seven guineas and a half for what is called a warrant. This warrant is sent to the Queen, and sent back with additional expenses; for even royalty, it seems, has some nice pickings out of the inventor's pocket. When the instrument comes back, the Attorney General has another slice of £5. It is again sent to the Queen, and returned with £7 13s. 6d. additional cost. The Signet-office, the Lord Keeper of the Privy Seal, the Lord Chancellor, the Lord Chancellor's Deputy, the Purse-bearer, the Clerk of the Hanaper, the Deputy Clerk of the Hanaper, the Deputy Sealer, and the "Chaff Wax,"—all have their pickings out of the inventor's money and brains. The "Chaff Wax!"—What an office to exist in the middle of the nineteenth century, and how characteristically the title describes the whole process! The fees, including the stamp duty, amount to the sum of £96, or about $500.

The system of paying for public services by fees is one of the remnants which ought not to have survived the times of Castlereagh and Sidmouth. The public officers of England are handsomely, even extravagantly paid, without the tortuous system of extracting hard-earned money from the struggling sons of toil.

The cost of obtaining a patent, not including fees for agency—if unopposed—is, for England, about $550; for Scotland, $400 more; and, for Ireland, $675 more—altogether about $1,625—a most scandalous charge; and the curiosity of all this is, the great price of an Irish patent: it is not worth so much as a Scotch one, yet it is dearer than an English one. The effect of this is shown by 23 patents having been secured for Scotland, last September, and only 5 for Ireland. The British inventors want their Patent Laws altered so as to resemble those of France.

In France patents are granted to the people of all nations, for ten or fifteen years: the tax is 500 francs (about $100) for five years, 500f. more for the next five years, and 500f. more for the fifteen years. These sums are paid in instalments of 100f. per year. The French law is superior to the American Patent Law, for the Government acts as public prosecutor, and holds the inventor harmless of expense. In our country the Patent Office often acts like a prosecutor of the inventor, and our law courts are more troublesome and expensive to inventors than those of any other nation.

In Belgium patents are granted for five or ten years, and the government tax may remain unpaid for two years after the grant. In Holland the patent fees are about $750 for fifteen years. In Prussia and Russia the government exercises a discretionary power in granting or refusing patents. In Russia the patent is granted for ten years, and costs about $250: in Prussia for eight years, almost nothing—not half as much as in the United States. The other countries of Europe are scarcely worth while mentioning.

We hope that the inventors of England will be able to get their Patent Laws reformed with all despatch, by Parliament: we also hope that the Great Seal will be modified from the size of a turnip to a decent sized crown-piece.

To show how the English Patent Laws work, at the meeting referred to, Mr. Ward, an inventor, moved a resolution declaratory of the defects of the existing patent laws, and of the delays and expenses which were engendered by the legal tribunals. He chiefly dwelt on the latter point, observing that if a patent cost only 5s., the expense of maintaining it through the present legal processes would of itself be ruinous. Patentees were constantly exposed to infringements, and the first step in defence cost the poor patentee 200*l*. (Hear.) He (Mr. Ward) had experienced these difficulties; he had had to proceed in Chancery, and had been occupied five months in examining witnesses in the court, owing to the system pursued of daily hours and half-hours. He had had to go through all this though the party proceeded against made no defence. ("Shame!") The case occupied five, yes, and nine months, and he had to pay 1,400*l*. as costs, though he gained his cause triumphantly, and though there was not a shadow of pretence for the opposition—the case being at last decided in an hour. (Hear, hear.) He believed his opponent, who was an enormously rich man, would never have given in but that his health had suffered from the vexation caused by the suit. (Hear, hear.) At present, a patent simply gave a right to go to law; and hence a poor patentee was frequently ruined.

This is a black enough picture in the working of the law, but let no one suppose that the evil is one belonging exclusively to the other side of the water, the same evil exists here, our patents are granted upon the same principle, and our U. S. Courts are guided in their action and decision by the English law.

### A Permanent U. S. District Court in New York.

Our editorial page is mostly taken up, this week, with matters relating to patents. We believe that every class of our readers—those interested in patents, and those who have no interest in them—will find something of interest in them. Every man, we don't care who he is, should have some acquaintance with Patent Laws. We now touch upon another question—it is one for the consideration of our Government; we allude to that which is indicated in the caption of this article, viz., a permanent open U. S. District Court in New York City. The law business now before this Court—the number of cases which have been dragging their way, snail-like, through all the tedious openings and closings of the terms, is a standard monument of its inadequate provisions to fulfil the claims of justice—the end and aim of all courts of law. There is as much business to be done in New York as would keep both Judge Nelson and Judge Judson sitting all the time; in fact, we believe that their time might all be nearly occupied in the trials of patent cases alone. The present term has been taken up with the trial of only two cases, and while there is a great number still on the docket, Judge Nelson had to set off and away. We know a witness who has come and gone back to his home, a distance of 190 miles, and his case was never brought up, and at last he had to go away altogether. It is wrong to have cases hanging on in suspense. Our courts are celebrated for "masterly inactivity." It is time that some reform was instituted, and one means to that end would be an open U. S. District Court in this city, for there are not adequate court provisions made for this city, in comparison with other Districts, when we take the number of inhabitants into account—for patents, we mean.

### Improvement in the Manufacture of Sugar.

Three weeks ago we noticed an improvement in the manufacture of sugar, by the centrifugal machinery constructed by Mr. Hartson, No. 58 Vesey street, this city. Since that time we have heard some doubt thrown upon the subject—unbelief manifested. Well, we have now samples of the sugar before it undergoes the mechanical process, and after it has been submitted to it, the one is like red sand, the other like pure white. We saw the brown sugar mixed with molasses, and watched the whole process until it was completed. Mr. Hartson is now making two of these machines, every week, for the South. We believe it to be one of the greatest inventions of the age. The process of the sugar manufacture has been greatly simplified within the past few years, and it has yet to be made more simple still. We shall be enabled to present engravings of this machine as soon as patents are secured for the improvements of Mr. Hartson at home and abroad. The improvements relate to the mechanical arrangement and construction of the machinery, and are truly valuable and important.

### California News.

The last news from California announced the breaking out of the cholera there. It had only appeared in a mild form, and the season was not favorable to its propagation. The gold was still abundant, but the Indians, in some parts, were getting troublesome, and a band of robbers were committing great depredations in the valley of the Sacramento. The wet diggings have been unfortunately subject to great freshets, and the dry diggings alone offered inducements.

### A Present.

We have received a present of a draught of a Card Making Machine, made by Mr. J. E. Earle, a young man of Leicester, Mass., who presents it to us as among his first efforts at Mechanical Drawing: it is well done. Mr. E. is a young man, enthusiastic to be a first rate mechanical draughtsman; he no doubt will attain to this distinction, as he possesses the very qualities which will make him so distinguished.

### Patents and Engravings.

Four out of the number of patents in our list of Patent Claims, this week, were secured through this Office. It is a matter of no small satisfaction to feel that the improvements secured are not trifling, but really useful. Along with publishing the claims, which are advertisements, it may be said, for the benefit of inventors, and of great moment to others interested in inventions—patentees would find it for their interest to get engravings of their inventions published in the Scientific American.

The Morse line of telegraph have laid their wires on the bed of the Hudson river a little above Fort Lee, which gives a free communication with the South and West.

Two hundred glaziers are employed on the Exhibition Building in Hyde Park. Each man can glaze sixty-four feet daily.

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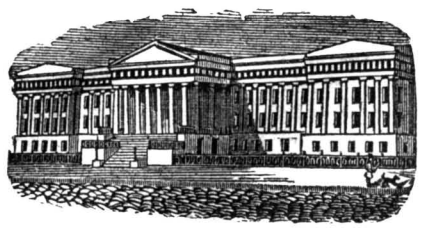

☞ Reported expressly for the Scientific American, from the Patent Office Records.

## LIST OF PATENT CLAIMS
### Issued from the United States Patent Office.

FOR THE WEEK ENDING NOVEMBER 20, 1850.

To Wm. Albertson, of New London, Conn., for Hinged Gun-Harpoons.

I claim making the shank of harpoons, and other whale irons, to fold by a hinge or joint at any convenient point in their length, in the manner and for the purpose substantially as herein described.

[See engraving in No. 2, this Vol. Sci. Am.]

To Hosea Ball, of Philadelphia, Pa., for improvement in Bake Ovens.

I claim the combination and arrangement of an endless chain platform with the oven, by which arrangement the unbaked bread, or other articles, being put in at one end, are discharged at the opposite end, completely baked; and, in combination therewith, I claim the self-opening and closing door, arranged substantially as herein set forth.

To Jarvis Chase, of Selma, Ohio, for improvement in working the doors of a Bee Hive.

I claim the arrangement of the bee boxes and moth chambers, in combination with the sliding screen doors, pulleys and levers, as described, so that the doors may be worked by a single movement of the lever, in the manner and for the purpose set forth.

To Gardiner Chilson, of Boston, Mass., for improvement in Air-heating Furnaces.

I claim, first, the annular chamber, constructed and arranged substantially in the manner and for the purpose set forth, with or without the cross-pipe.

I also claim the mode of conducting off the products of combustion from the fire through ascending pipes, into an annular chamber, and thence into a central descending pipe to their exit, and the surfaces being all so constructed of a curved figure as to allow a diverting influence, and free circulation to the exterior air in the air-chamber, to be warmed without over-heating it; while it is, by the arrangement of parts, forced to impinge directly against the heated surface.

I also claim the method of setting the furnace, consisting of a double walled chamber, the inner wall of which encloses a cold air trench, supplied from without, that surrounds the ash-pit, with openings at its top for the proper admission of air into the air-chamber, around the furnace, and with lateral openings into the spaces between the walls, and causes an upward current, which is connected with the warmer pipes leading to the apartments, by means of which a constant and pure supply of air is insured, and the heat greatly economised.

To David Eldridge, of Philadelphia, Pa., for improvement in Corn Shellers.

I claim the combination of the wheels for shelling corn, as herein described.

To Wm. Frost, of New York, N. Y., for improvement in Mills for Grinding and Crushing.

I claim the use of the cylinder grooved or notched, or smooth, being made to rotate, and having, within it, any number of crushers formed as described, for the purpose of pounding, grinding, or mixing any substance, the crushers either running singly, or, for the purpose of working different substances, simultaneously one within another, the jumping bar or pin, in combination with the arrangement substantially the same.

[This machine is constructed upon a new principle, and is a good one for crushing and grinding ores, paints, &c. It is owned conjointly by Mr. A. G. Bagley, the gold-pen manufacturer, this city.]

To John Garvey, of New York, N. Y., for Improved Annunciator or Bell Telegraph.

I claim the combination and arrangement of the spring lever, suspended bar or striker, with the pendulums and bells, for simultaneously indicating the number of the room, and calling the attention thereto, by giving the alarm, there being a secondary or intermediate fulcrum bar, against which the spring lever impinges in its descent, increased by the spring, by which the rear end is made to descend, and with it the suspended striker, upon the bells, and at the same time suddenly elevating the front end of the lever, and imparting a vibratory movement to its pendulum, said spring levers being provided with oblong openings or slots, through which the fulcrum bar passes, for producing the aforesaid action of the spring lever, on its descent upon the intermediate fulcrum bar, as described and represented.

To Frederick Langenheim, of Philadelphia, Pa., for improvement in Protographic Pictures on Glass, &c.

I claim the combination of the ground or frosted glass, or other semi-transparent substance interposed in connection with the picture, between the source of light and the spectator, substantially as described.

To John E. Larkin, of Ballston Spa, N. Y., for method of attaching augers to their handles.

I claim the handle made in two parts, one of which fits in a socket on the other, and carries a bolt secured at its end, the said bolt passing through a hole in the auger shank, and screwing into a female screw or nut, in the part A, for the purpose of clasping or firmly holding the auger shank between the ends of the parts A and D of the handle or stock, substantially in the manner herein described.

[See engraving, page 388, Vol. 5, Sci. Am.]

To Elijah C. Middleton & Edwards Nevers, of Cincinnati, and Robt. Neale, of Mount Carmel, Ohio, for improvement in Copper and Steel Plate Printing Presses.

We claim, first, the arrangement of a tooth or catch, projecting from the roller, and operating upon a tooth or projection upon the platen, for the purpose of starting the platen, and causing the commencement of the convexity of the roller to impinge upon any required point of the length of the platen, for the purpose described.

Second, the combination of the racks, with the cog-wheel attached to the connecting rod of a gang of rollers, together with the beads and the grooves in the rollers for security, uniformity of action, and a proper relative position between the platen and the supporting rollers upon which it traverses, thus preventing lateral and longitudinal aberation.

Third, The method of heating and retaining at a suitable temperature, the plate from which the impressions are to be taken by means of lamps or of vessels contai ing inflammable material, placed under the upper plate of the platen, or traversing bed, within the recess formed between that and the plate resting immediately upon the gang of rollers.

Fourth, The arrangement of a stationary and sliding clamp, adjustable longitudinally to the platen, for securing the plate in position, substantially in the manner described.

Fifthly, We claim, in combination with the roller, the method of retracting the platen by the weighted cord, adjusted by making an inclined plane of the bed on which the rollers traverse.

To Martin Newman, 2nd, of Lancaster, Pa., for improvements in Excavating Machines.

I claim, first, operating the bucket by giving motion to the band or chain, and to the drum, in one direction, to fill the bucket, and then reversing its motion so as to draw back the bucket, to be emptied in the manner as herein described.

Secondly, I claim the manner, substantially as herein described, of closing the bottom or trap of the bucket, by means of the spring, or incline, over which it passes in its forward passage.

To J. H. Robinson, of Charlestown, Mass., for improvement in Pessaries.

I claim the solid connection, with connecting contrivance, or its equivalent, and joint in combination with the supporting stem, the whole being substantially in the manner and for the purposes hereinbefore specified.

To E. T. Shoenberger, of Pittsburgh, Pa., for improvement in Extension Tables.

I claim the construction of extension in such a manner as that the sliding parts, when extended, shall constitute a table complete, without any replacing of pannels to form the leaf, substantially in the manner herein set forth.

To Samuel Swett, of New York, N. Y., for improvement in Spark Arresters.

I claim combining in the manner substantially as described, with the chimney, the surrounding jacket and the cap, a valve for governing an apperture in the top plate of the cap, so balanced or weighted that it shall open by gravity when the furnace is working under a draft due to the rarefication of the column, and be closed by the force of the current when increased by the exhaust steam in the chimney, for the purpose and in the manner substantially as described.

I also claim, in combination with the valve and the wire gauze, or the equivalent thereof, and the deflector over the chimney, all arranged substantially as herein specified, and for the purposes set forth.

To Wm. Zaizer, of Cincinnati, Ohio, for improvement in Bedsteads.

I claim the combination of the slats, clasps, and hooks, athwart the length of the outside slats, in combination with the rails and latches on the posts, the whole combining to form a strong and portable bedstead.

### DESIGNS.

To John S. Royce, of Cuyleville, N. Y., for design for carriage plates.

To C. P. & G. B. Gordon, of Boston, Mass., for design for Spoon Handles.

## Paine and his Electric Light.

MESSRS. EDITORS—What has become of "Paine's Electric Light?" Alas, for us New Yorkers, after being raised up to the skies, in anticipation of beholding the great *light*, which was to eclipse all our murky looking candles, oil, camphene, and gas lights, we are still compelled to grope on in the old fashioned way. I early took the opportunity, page 61, Vol. 5, Sci. Am., to expose the absurdity of Mr. Paine's alleged discovery, and in a number of letters published at various times since, in the same volume, left him no room to shirk his first announcement, made two years ago, on the 29th of the month of December, and which he has never yet fulfilled. In a letter, by referring to my Vol. 4, page 101, Sci. Am., Mr. Paine there announces that he would expose his light for one year to the public, "and the different scientific bodies of America and Europe, to allow any person to establish a prior claim to the invention, if they could, and afterwards he was to make public the mechanism of his Generator." This he stated in his circular. He has not fulfilled his promise to the public, and the reason, no doubt, is a good one—he cannot. Two years have expired since he published his first letter, but the public have yet to know how Mr. Paine produces his cheap light—4,000 lights of which, burning for 5 hours every day for one year, were to cost less than two dollars.

Mr. Paine has announced a new discovery beside his first light, viz., his letter in No. 3, this volume of your paper. His alleged discovery there about his whirl-go-round electric discovery, to propel vessels, is more ridiculous than his light. Before he announces any more discoveries I hope he will fulfil his first promise, and give us something more than mere bombastic assertions about his i ventions.

It is very wrong to abuse public confidence by playing upon the marvellous—it cannot be done with impunity. After all the excitement about this light—it is no where. His letters were published in all our papers, and copied into European journals, and after all, it has oozed out into darkness; and his late discovery of perpetual motion will go the same road. It is so easy for Mr. Paine to disabuse the public mind, if he has discovered anything, which I don't believe, and will not believe until I see it and know all about it—that he has no business to complain if he is looked upon as a chimerist. It is a great pity that he was not more careful, prudent, and cautious in making his first announcement, but his last caps the climax of all. Let the first be demonstrated, and then the public will be able to believe and digest the last—not before.

CARBURETTED HYDROGEN.

ANNOTATION.—By a letter dated Worcester, Nov. 29, 1848, Mr. Paine publicly asserted that he would expose his light one year and then make it public. On this week Friday, two years will have expired, and the promise not be fulfilled. C. H.

## Interesting Patent Cases.

Before Judge Nelson, in the U. S. Circuit Court, this city, after a long and tedious trial, the famous Lead-pipe Case was terminated on Thursday last week, the 21st inst. The suit was for the recovery of damages for the alleged infringement of a patent to Mr. Benjamin Tatham, in 1841, for an improvement in machinery for making lead-pipe, Samuel G. Cornell & Co. being the alleged infringers. The defence was, that Messrs. Cornell & Co. did not use Tatham's improvements, but a different combination, also secured by patent to Mr. C., in 1847.

The Court, in its charge, said if the Jury believe that the defendants used the same combination, substantially, that was found in plaintiff's patent, they infringed his patent—but if the changes were substantially different, then they did not infringe—also that if the changes in the mechanical construction of the machine made by defendants were apparently of a similar form, yet if they produced a new and useful effect, different from that of plaintiff, in the manufacture, then they did not infringe.

The Jury returned a verdict that plaintiffs were the original inventors of the machine patented by them—and that the patent had been infringed by defendants. They found damages in favor of plaintiffs for $2,245. For plaintiffs, Messrs. Staples, Goddard, Cutting and O'Connor; for defendants, Messrs. Stoughton & Harrington, and Wm. C. Noyce.

## Good Properties and Virtues of Milk.

An experienced physiologist and chemist, declares milk to be a most perfect diet. There is probably nothing better adapted to our sustenance, containing curd casein, which is necessary for the development and formation of muscle—butter for the production of an adequate supply of fat—sugar to feed the respiration, and thereby add warmth to the body, the phosphates of lime and magnesia, the peroxide of iron, the chlorides of potassium and soda, with the free soda, required to give solidity and strength to the bone—together with the saline particles so essentially necessary for other parts of the body. It contains lactic acid, or the acid of milk, which chemists inform us is the acid of gastric juice, so requisit for the proper dissolving of our food in the stomach It is, therefore, obvious that milk should be chemically correct in all its constituents, and that its beneficial effects on the constitution should not be neutralized by adulteration, "it is," Dr. Prout properly states. "the true type of all food." How necessary, therefore, is it that it should be pure; otherwise, this wonderful and wise provision of Providence will be a curse rather than a blessing.

In the city of New York however, it is almost impossible to get pure milk. It cannot at least be purchased but in few groceries; the most of it is composed of disgusting and injurious compounds.

## A Mammoth Globe.

A curious exhibition is in course of preparation for the World's Fair, by Mr. Wyld, M. P., the eminent map engraver. He is constructing a huge globe, of 56 feet in diameter, which will be provided with a convenient mode of ingress and egress; the different countries of the world will be represented upon the inner, and not upon the outer surface, and the interior will be fitted up with galleries and staircases, so as to enable visitors to make a tour of the World, and visit each of the countries whose industry or productions will be displayed in the Great Exhibition.

## The Chinese Doctors.

The Chinese doctors are not paid for the number of doses they give their patients and the length of their sickness, but are paid to keep their subjects from being sick:—the sick days of the subject are deducted from the doctor's yearly salary. The Chinese may well laugh at our barbarism, in the way of paying our doctors,—but if we were to adopt the Chinese rule, our doctors would be very scarce, unless they had perfect command over our diet, labor, and exercise.

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### TO CORRESPONDENTS.

"E. C., of Miss."—There is no question about the fact that black lead is adulterated to a great extent with lamp-black, sulphuret of antimony micaceous iron ore, &c. The public are grossly imposed upon by the admixture of ingredients with many articles offered as pure. The white fluored sugar is generally adulterated, or it could not be afforded at such a low price, compared with the finer qualities of brown sugar. It is, without doubt, the most expensive article to manufacture.

"J. W. O., of Ohio."—Your case will come up for advisement during this week, and the the result will be communicated by letter.

"C. G., of N. H."—The Mr. Spaulding referred to is L. A. Spalding, Lockport, N. Y. —to whom you can address a letter of enquiry. We know nothing more about the matter further than the notice in the Sci. Am Sept. 28th, 1850.

"W. H., of Mass."—We would not advise you to do anything about the matter, as it is very doubtful whether it would pay or not. This is our opinion. You are, without doubt, possessed of good inventive faculties, and ought not therefore to get discouraged.

"D. S., of N. Y."—We have seen two plans of a hydraulic motion, similar to yours, before, but none of them will answer. Action and Re-action are equal: get up a machine and satisfy yourself; you will find that we are on the right side.

"B. J. N., of Pa."—You will see by reference to No. 9, this Vol., that your invention is the same in principle as Mr. E. Campbell's. We have sent you the back numbers.

"V. B., of Conn."—The theory you advance has exploded—no reliance can be placed on it; give it up without delay, it is for your interest.

"H. W., of Ala."—You can obtain the dividers of Messrs. Benj. Pike & Son, 166 Broadway, this city. They could not be sent by mail.

"M. F. G., of Iowa."—The papers relating to your application can be prepared at this office—but they would have to be sent to you for signature and oath. A model would be required in the first instance. Mr. C. can obtain a portable steam engine and boiler—on application to Chas. F. Mann, Troy, N. Y. It would need to be made to order—for particulars address him.

"C. L., of Conn."—Yours next week.

"T. C., of Ohio."—Your size, made of common glue, certainly will not answer; copal varnish is the best, but if warm water is used it hurts it also. If you could submit the wood to a great heat, and give it two or three coats, it would stand well.

"T. W. N., of Phila."—We have got your drawing; the work to be done is very particular, and will require a great deal of labor.

"D. H. M., of Ohio."—We do not know of a single patent with which your bridge would conflict, and we cannot see where we could institute a good new claim. The side trussing is not new, and floors have been constructed in almost every possible way. We have never seen a top and floor constructed in one bridge, like yours, but longitudinal and cross-ties, with diagonal braces extending through the whole length of floor, is that of the old Wettingen bridge.

"R. C., of N. Y."—See the advertisement of J. D. Johnson, Redding Ridge, Conn., in regard to a shingle machine. The expense of rigging it out, under the circumstances you speak of, could not cost over $10. This machine is a good one.

"G. C., of N. Y."—Your model is received, and the business will be done as soon as possible.

"B. A., of N. C."—The price of Wheeler's horse powers referred to are, for 2 horse, $105; 1 horse, $80.

"F. R. Van T., of O."—A process is already in use for rendering friction matches water-proof, but if you have a new process that is more simple, for producing the same result, it is patentable.

"B. & P., of N. Y."—We do not believe that you can get a patent, because the crude turpentine hrs been used for soft soap often, and its alkaline qualities are well known.

"H. J., of Ind."—We have a Volume 5 laid aside for you; which is subject to your order. We could not advise you, or any one, to take out a patent on your invention, in Europe; we do not think it would pay, the English fees are so exorbitant.

"A. C., of Conn."—We cannot take up much room in giving reasons, but we give our opinion briefly:—You should at once apply for a patent, and satisfy yourself; we do not, knowingly, advise people to spend money in doubt. A simple pressure balance valve is not new. You may rest assured that your invention is safe with us. We know how difficult it is to get patents on some things.

"E. B., of Mass."—We cannot see how any power is gained by your double cylinder; the double piston is not a new plan, it was patented in England last year, but we did not then, and do not now, like it. The simple single piston and cylinder, be assured, is the best plan.

"F. H., of Mass."—We do not know the kind of varnish used by the shade painters, to which you refer; it is probably parchment size.

"E. B., of Charleston."—We will present the spirit of your letter next week. You may be assured, however, that the thing is not practicable.

J. A. S., of St. Louis.—We received yours just as we were going to press.

"J. Y., of Penn."—You are, perhaps, not aware that wheels have been constructed to increase or diminish the quantity of water. This principle is described in the patent of Haviland & Tuttle.

"J. W. A., of Mich."—Will give yours attention next week.

"J. M. C., of Md."—Multiply the 115 lbs., by the H., 25 feet. It is not a horse power; it is equal to 2,875 lbs. raised 1 foot high per minute.

"G. W. B., of Phil."—We are much obliged, and will call the attention of our readers to the subject next week.

"S. A., of Penn."—Use the plan on page 97 of your book.

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Money received on account of Patent Office business, since Nov. 20, 1850:—

U. P., of Conn., $30; N. B., of R. I., $25; B. F. M., of N. H., $25; H. N. D., of N. Y., $30; I. B. L., of Vt., $30; M. & G., of S. C., $55; W. & F. of N. Y., $10.

### An Important Paragraph.

To preclude our subscribing friends the necessity of writing for the back numbers of the Scientific American, we shall forward to all new subscribers the back numbers of Vol. 6, dating their subscriptions from the commencement unless they instruct to the contrary when they remit. We shall pursue this course of sending the back numbers issued on this volume until No. 13, and after that time the names will be entered from the date of the reception of orders, unless the writer expresses a wish to receive the back Nos.—in that case they will be promptly forwarded.

Those desiring volume 5 of the Scientific American are informed that we are able to furnish a few complete volumes, (bound) at $2,75 each. Also, we can send by mail sets complete, minus No. 1, for $2. We would also say, that whenever our friends order numbers they have missed—we shall always send them, if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

### Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and the year the patent was granted (adding the month of the year when convenient), and enclosing one dollar as fee for copying.


**TO IRON FOUNDERS AND MACHINISTS** in the Northern and Eastern States.—The Subscriber, sole agent for the sale of rights to make and sell the celebrated Bogardus Horse Power, will contract with any one disposed to manufacture the best horse power in the world, upon reasonable terms. Address GEORGE VAIL, Morristown, N. J. 1am 1y*

**TO HAMMERSMITHS.**—Wanted, a Tilter. Apply to the N. Y. Cast Steel Works, foot of 24th street, East River, New York. 6tf

# ADVERTISEMENTS.

**Terms of Advertising:**

One square of 8 lines, 50 cents for each insertion.
" " 12 lines, 75 cts., " "
" 16 lines, $1,00 " "

Advertisements should not exceed 16 lines, and cuts cannot be inserted in connection with them for any price.

## Patent Office.

128 FULTON ST.

**NOTICE TO INVENTORS.**—Inventors and others reqniring protection by United States Letters Patent, are informed that all business relating to the procuration of letters patent, or filing caveats, is transacted at the Scientific American Office, with the utmost economy and despatch. Drawings of all kinds executed on the most reasonable terms. Messrs. Munn & Co. can be consulted at all times in regard to Patent business, at their office, and such advice rendered as will enable inventors to adopt the safest means for securing their rights.

Arrangements have been made with Messrs. Barlow and Payne, Patent Attornies, in London, for procuring Letters Patent in Great Britain and France, with great facility and dispatch.

MUNN & CO.,
128 Fultonstreet, New York.

**ALCOTT'S CONCENTRIC LATHES.**—We have on hand a few of these celebrated Lathes, which the inventor informs us will execute superior work at the following rates:—

Windsor Chair Legs and Pillars, 1000 per 11 hours. Rods and Rounds, 2000; Hoe Handles, 800; Fork Handles, 500; Broom Handles, 1500, per 11 hours.

This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch, and work as smoothly as on a straight line, and does excellent work. Sold without frames for the low price of $25—boxed and shipped, with directions for setting up. Address, (post paid) MUNN & CO.,
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**IMPORATANT NOTICE TO CONFECTIONARY MAKERS**—Whereas, a patent was granted to the undersigned, Oct. 8th, 1850, for an improvement in the manufacture of Comfits, and from certain knowledge which he has received, he believes that parties are using it without his consent. Vigorous measures are now being taken to ascertain who the unprincipled parties are, in order that they may be dealt with according to law. This notice is to warn all not to infringe the patent, as it is not the intention of the patentee to dispose of rights. Parties using it will have no authority. W. H. HOLT, Patentee.
Hartford, Conn., Nov. 25, 1850. 11 8*

**THE SUBSCRIBER** is now finishing four 14 horse engines, with boiler and apparatus all complete—price $1200 each. Several 6 horse engines extremely low; also, several of smaller capacity, complete; also, several power plainers, now finishing.—Galvanized chain for water elevators, and all fixtures—price low—wholesale and retail. Orders, post-paid, will receive prompt attention. AARON KILBORN.
No. 4 Howard st., New Haven, Conn. 11 6*

**BAILEY'S SELF-CENTERING LATHE,** for turning Broom and other handles, swelled work, chair spindles, &c.; warranted to turn out twice the work of any other lathe known—doing in a first rate manner 2000 broom handles and 4000 chair spindles per day, and other work in proportion. These lathes are simple in construction, not liable to get out of repair, and will do enough more than other lathes, in three months' use, to pay their cost. One of them may be seen at the office of Munn & Co., New York. Price of Lathe for turning broom and hoe handles, rake stales, scythe snaths, windsor and cottage chair legs and pillars, $100, with one set of tools; $125 with two sets. Lathe for turning chair spindles, whip stocks, gun rods, &c., complete, $75. Orders, post-paid, may be forwarded to L. A. SPALDING, Lockport, N. Y. 93m

**MACHINES FOR CUTTING SHINGLES.** The extraordinary success of Wood's Patent Shingle Machine, under every circumstance where it has been tried, fully establishes its superiority over any other machine for the purpose ever yet offered to the public. It received the first premium at the last Fair of the American Institute—where its operation was witnessed by hundreds. A few State rights remain unsold. Patented January 8th, 1850,—13 years more to run. Terms made easy to the purchaser. Address, (post-paid) JAMES D. JOHNSON, Redding Ridge, Conn., or Wm. WOOD, Westport, Conn.. All letters will be promptly attended to. 10tf

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Oakland Works, Sag Harbor, L. I.

"Mr. Byram has established his reputation as one of the first clock makers in the world"—[Scientific American. 4 3meow*

**COTTON MACHINERY FOR SALE**—Viz. 4 fitling frames, 144 spindles each; dead spindle, nearly new; 1 three head drawing frame, with extra rolls; 1 Mason's speeder, 16 strand; 1 lapper; 1 cone willower; 1 band machine; 1 bundling press; 1 warper—on very reasonable terms, by ELI WHITNEY.
New Haven, Nov., 1850. 9 6*

**RAILROAD CAR MANUFACTORY.**—TRACY & FALES, Grove Works, Hartford, Conn. Passage, Freight and all other descriptions of Railroad Cars, as well as Locomotive Tenders, made to order promptly. The above is the largest Car Factory in the Union. In quality of material and in workmanship, beauty and good taste, as well as strength and durability, we are determined our work shall be unsurpassed. JOHN R. TRACY,
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**ALLEN'S PLANING MACHINE.**—Sole proprietor for Ohio, D. E. GARDNER, Marietta, Ohio. 8 4*

**GURLEY'S IMPROVED SAW GUMMERS**—for gumming out and sharpening the teeth of saws can be had on application to G. A. KIRTLAND, 205 South st., N. Y. 10 6

**TO MANUFACTURERS AND PATENTEES.**—A person of business habits would be willing to invest some $3,000 to $5,000 in an established manufactory in Brooklyn or New York, or in the production of a newly patented article of real merit and general use. Address A. B. C., to the care of the Editors of this paper. No letter will be taken from the office unless post-paid. 102*

**SCRANTON & PARSHLEY,**—New Haven, Conn., will have finished by the 15th of December, 12 Engine Lathes of 8, 10 and 12 feet beds, and weigh 1500, 1650, and 1800 lbs; price $200, $220 and $240. These Lathes are from a new set of patterns, and are greatly improved from their former small size lathes; they swing 21 inches, and have back and screw gearing, centre rest, follow rest, drill, chuck and overhead reversing pulleys, all hung in a cast iron frame, ready for use. On and after the first of Dec., by addressing as above (post paid) cuts can be had of these, with index card, showing the different pitch threads that these lathes will cut.

Two of the power planers heretofore advertised in this paper, are now ready to ship to the first order; they weigh from 4500 to 4600 lbs., when finished. 9tf

**A CARD.**—The undersigned begs leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers, and manufacturers of all kinds of instruments, to his new and extensive assortment of fine English (Stubs) and Swiss Files and Tools, also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English style, which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN, Importer of Watchmakers' and Jewellers' Files and Tools, and manufacturer of Mathematical Instruments, 154 Fulton street. 1 3m*

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**BOSTON LOCOMOTIVE WORKS.**—No. 360 Harrison avenue, Boston, manufacture at short notice, Locomotive and Stationery Steam Engines, boilers,—iron, copper, composition and brass castings; copper work; Van Kuran railroad car and truck wheels, and all kind of railroad machinery.
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**FELLY CUTTING MACHINE.**—MESSRS JOSEPH ADAMS & SONS, Amherst, Mass., offer for sale town, county and State rights, or single machines, with the right to use, of this unrivalled Felly Cutting Machine, illustrated in No. 5, Vol. 6, Scientific American. It is portable, easily kept in order, requires but little power to drive it, and will execute in the most rapid and perfect manner, cutting 60 good fellys in one hour. 6tf


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# Scientific Museum.

### The Adulteration of Sugar.

At a recent meeting of the London Botanical Society, a paper was read by Dr. Arthur Hassall, on the Adulteration of Sugar, a condensed but clear abstract of which we here present, which cannot but be of much interest to our chemists, planters, &c. :—

Two kinds of sugar have been particularly distinguished by chemists, viz., cane and grape sugars. The first named sugar is obtained from the cane, the beetroot, the maple-tree, and one or two other plants; while the second is contained in most fruits and honey. These two sugars differ in their properties, and chemists have hitherto supposed that grape sugar might at all times be discriminated from cane sugar by means of certain tests; a point of very great consequence, since cane sugar is very frequently with a form of grape sugar, made artificially from potato flour. Thus Dr. Ure, in the Supplement to his "Dictionary of Arts, Manufactures, and Mines," at p. 250, writes, in reference to the well known copper test, "With my regulated alkaline mixture, however, I never fail in discovering an exceedingly small portion of starch sugar, even when mixed with Muscovado sugar, and thus an excellent method is afforded of detecting the frauds of the grocers."

Dr Hassall stated that he regretted that his observations did not allow of his confirming the remark of Dr. Ure and some other chemists, as to the value of the copper test in detecting the adulteration of cane with grape sugar. Thus, Dr. Hassall found that when applied to thirty-six different brown sugars obtained from grocers, the red oxide was thrown down in every case; that the same result ensued when the test was employed with sugars procured from the hogsheads, and even with that taken direct from the sugar cane itself; also that the oxide subsided when applied to lump sugar in three cases out of twelve, and that this result ensued in all the refined sugars after they had been boiled and reduced to the state of syrup. For these reasons, therefore, it is evident that the copper test is of no use whatever, as applied to the question of adulteration of cane with grape sugar. Finding, then, chemistry to fail him in this inquiry, Dr. Hassall had to rely, in following out his investigations, almost exclusively upon the microscope.

In sugar produced from cane, broken fragments of the tissues of the cane were always to be detected by the microscope, in great abundance, in the sugars imported, and that thus a valuable test of the presence of cane sugar in many articles was afforded. In potato sugar a certain number of starch granules was frequently to be detected.

He found fragments of cane in all that he examined, except a very fine white purified sugar. Beetle-like animalcules were found in 19 cases,—these animalcules were evidence of great inferiority, due to a great quantity of molasses remaining in the sugar. Sporules of fungi were present in 10 cases, showing that there had been fermentation—this was more common in beet root sugar.

That in the whole of the sugars submitted to examination, a variable quantity of starch or flour existed as free granules, aggregations of granules, or cells, as those of the potato.

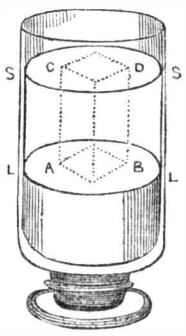
The results of the examination of fifteen different specimens of lump or refined sugar were given. From an examination of these, it appeared that animal matter, employed in refining the sugar, was present in ten instances; that saw-dust like fragments of woody fibre were observed in twelve cases, being very numerous in seven examples; that a greater or less quantity of starch was present in the whole fifteen sugars; and that in no one instance were either beetles, fungi, or fragments of cane to be detected. Dr. Hassall, therefore, considered that these fifteen sugars were beyond question adulterated, and that inasmuch as sugar, in its refinement, undergoes additional boiling and careful filtration, the smallest number of starch granules found in lump sugar is to be regarded as sufficient evidence of adulteration.

Contrasting the condition of moist and lump sugar, as met with in commerce, he said, it is evident that the impurities and adulterations of the former are much greater, and of a more objectionable character than those of the latter; that while in the one there are very commonly present fragments of cane, animalcules or beetles, flour, British gum, potato sugar, sporules of fungi, woody fibre, and grit; in the other, we at least get rid of the beetles, fungi, &c., and encounter only the lesser evils —flour, and a proportion of woody fibre. On this account, therefore, Dr. Hassall recommends the more general use of refined sugar.

### Hydrostatics.

(Continued from page 80.)

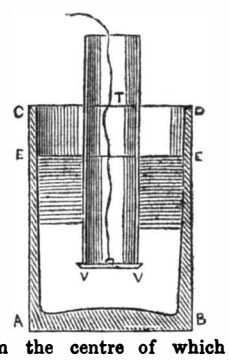
Fig. 5.




As set forth in the last article, the whole interior surface of a vessel is subject to an enormous pressure, in consequence of the manner in which liquid pressure is transmitted, and not only the interior surface, but the liquid particles in every part of the vessel. In the interior of the liquid mass contained in the vessel, figure 5, let us imagine a layer, L L, parallel to the surface, S S. All the particles of this layer are pressed by the mass of the liquid above,—they are under the pressure of a liquid cylinder; the pressure from above, downwards is on the principle of action and re-action, exactly equal to that from below, upwards, and the separate particles of the layer, L L, are held in equilibrium by equal and opposite pressures. By taking a portion of the layer, A B, it will be observed that the surface is at once pressed from above, downwards, by the liquid column, C D B A, and from below, upwards, by a precisely equal force, so that if a solid were plunged into the water, whose base exactly occupied A B, this pressure would act upon the solid from below, upwards, tending to drive it out of the liquid.

By taking a tolerably large glass tube, T, fig. 6, ground flat at its lower extremity, is closed by means of a glass plate or valve,

Fig. 6.




V V, from the centre of which proceeds a cord up to the top of the tube. If the surfaces be smooth, the valve will close the tube water-tight, by pulling the string. On lowering the tube into the vessel of water A B C D, the valve will be upheld by the pressure of water, upward and the string let go, for the upward pressure which it sustains, is equal to that which it would sustain at that depth from a column of water acting from the surface downwards, is proved by pouring water into the tube. As soon as the interior level approaches the exterior, A A, the glass valve is pressed from above, as much as it is pressed from below, and it then falls to the bottom of the water by its own weight, or rather by the difference between its weight and that of an equal bulk of water.

The pressure upon a given surface of water is the same, whether it face upwards or downwards, and may also be proved to be the same in whatever direction it be turned, provided its centre of gravity remains at the same depth below the liquid surface; for this pressure is equal to the weight of a column of liquid, whose base is the given surface, and whose length equals the depth of its centre of gravity.

In water, the pressure of any surface, at the depth of 1 foot, is nearly equal to ½ lb. on the square inch; at 2 feet it is about 1 lb.; at 3 feet, 1½; at 4 feet, 2 lbs. In a cubical vessel full of a liquid, the pressure on any one side is equal to one-half the pressure on the base; for the bottom sustains a pressure equal to the whole weight of the fluid, and the pressure sustained by each side is equal to the weight of a mass as long and broad as that surface, and as deep as its centre, and consequently to half the contents of the vessel. From this is adduced the remarkable result, that in a cubical vessel, a liquid produces a total amount of pressure three times as great as its own weight, for if this equal 1, and the pressure upon each of the four sides be equal to half of that upon the base, we have $4 \times \frac{1}{2} = 2$, and $2 + 1 = 3$.

### New Method of Producing Burning Fluid.

We learn by the London Mechanics' Magazine, that a Mr. Abraham M. Marbe, of Birmingham, lately secured a patent for a new process of making burning fluid, which must be of great interest to many of our readers. It is prepared from oil of turpentine :—To one gallon of the oil of turpentine, 1 pound of sulphuric acid and a quart of water are added. This is stirred, and, after standing for three hours, the clear liquor is decanted into a vessel containing water, by which the remaining acid is separated from it. Into another suitable vessel, a pound of fine lime is put for every gallon of liquor, and the liquor is then gradually poured in and stirred along with the lime. This is left to settle for a night, when the clear is drawn off and is fit for burning, instead of turpentine. It is necessary, however, for a purer spirit, that it should also undergo the following process :—For every gallon of liquor have a vat, in which is placed 4 ounces of fine lime and half a pound of burned potash. Wet this, with half a pound of alcohol, and allow the vapor to subside : then add more until the lime and potash are covered with about a pint of alcohol for every gallon of the purified spirit, already described, a gallon of which is added for every half pound of the lime and potash. After this settles, the clear is distilled, and a beautiful burning fluid is the result.

### Adulterated Drugs.

"Calomel is often adulterated by an admixture of various white powders, such as chalk, sulphate of bartya, white lead, and is sometimes contaminated by some corrosive sublimate, carelessly left in it by insufficient washing; also by common salt, and by sal ammoniac."

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"Magnesia is often contaminated by carbonate of lime (chalk), which either has been fraudulently mixed with it, or because the magnesian salts from which it has been obtained were naturally contaminated with salts of lime, as is the case, when prepared for the mother-waters used in the manufacture of nitre, and common salt. The best is that obtained by precipitating a solution of sulphate of magnesia by one of carbonate potash or of soda."

"Carbonate of soda is often adulterated to an excessively large extent, by mixture with crystals of sulphate of soda, which are only half the price of the carbonate, and which for detergent purposes, are of no value whatever."

"Vermillion is often fraudulently mixed with red lead, peroxide of iron, and brick dust, and with sulphuret of arsenic."

"Black lead is adulterated to an enormous extent with sulphuret of antimony, micaceous iron ore, but more particularly lamp black. An extraordinary quantity of this substance is sold in small packets, for the purpose of brightening stoves, and some of these packets are adulterated with as much as from fifty to sixty per cent of lamp black."

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Outlines of Physiognomy, or the Twelve Qualities of the Mind.—No. 2 of this new System of Physiognomy, by Dr. J. W. Redfield, of this city, has just been published by J. S. Redfield, Clinton Hall, N. Y. This work is written in a familiar manner, in a series of letters to a friend. Dr. Redfield, it is well known, is an enthusiast in this field, which he has rendered not only interesting but instructive. There is scarcely an individual living who is not, by nature, a believer in physiognomy :—we form opinions of individuals by their looks, the first time we see them, and that, as it were, by instinct. There must be some reason for this; certainly it is an evidence of the truth of physiognomy, the question is to get at the truth. Dr. Redfield's work throws a great deal of scientific light on the subject, and makes his little book as readable as a romance. The price is only 25 cents—it should be universally read.

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